

WHAT IS CLAIMED IS:

Sub A 5 1. A two-ply polyurethane geotextile composite in which a rigid, dimensionally stable geotextile is bonded to a soft, pliable geotextile with the solidifiable liquid polyurethane composition which is a reaction product of a mixture comprising:

- a) a liquid polyisocyanate having an isocyanate content of at least 10% by weight,
b) 10 an isocyanate reactive component comprising a polyether polyol having from 2 to 6 hydroxyl groups and a number average molecular weight of from 250 to 8,000 and 0 to 10% by weight, based on total weight of b), of a low molecular weight diol or triol having an equivalent weight of from 31 to 99,
c) 15 a urethane catalyst, and optionally,
d) a filler.

20 2. The composite of Claim 1, wherein the polyether polyol b) comprises a polyoxypropylene polyether having a number average molecular weight of from about 400 to about 4,000 and an average functionality of 2 to 3.

25 3. The composite of Claim 1, wherein the polyether polyol b) comprises:

- (i) from about 5 to about 15 parts by weight of a propylene oxide adduct of an alkanolamine which adduct has a number average molecular weight of from 250 to about 1000,
(ii) a propylene oxide adduct of a low molecular weight organic compound having from about 3 to about 6 OH

groups which adduct has a number average molecular weight of from 250 to 1000, and

- (iii) a propylene oxide adduct of a low molecular weight diol which adduct has a number average molecular weight of from 250 to about 3000.

5 4. The composite of Claim 1, wherein the catalyst c) comprises
SUB B
B7 an organic tin compound.

10 5. The composite of Claim 1, wherein the liquid polyisocyanate
a) is an aromatic polyisocyanate.

10 6. The composite of Claim 1, wherein the liquid polyisocyanate
a) is a polymethylene poly(phenylisocyanate) having an NCO-content of
about 30 to 33% and a viscosity of about 20 mPa·s to 2,000 mPa·s at
25°C.

Solid Art 7. The composite of Claim 1, wherein the rigid, dimensionally
15 stable geotextile has a maximum thickness of 1 mm.

8. The composite of Claim 1, wherein the soft, pliable geotextile
has a minimum thickness of 1 mm.

9. The composite of Claim 1, wherein the soft, pliable geotextile
has at least one side burnished.

20 10. The composite of Claim 1, wherein the solidifiable liquid
polyurethane composition does not include a filler d).

SUB B 11. The composite of Claim 1, wherein the polyether polyol b)
does not include a low molecular weight diol or triol.

25 12. A process for producing a two-ply polyurethane geotextile
composite comprising

- (1) applying a solidifiable liquid polyurethane composition
to at least one of a rigid, dimensionally stable
geotextile or a soft, pliable geotextile, the solidifiable
liquid polyurethane composition being a reaction
product of a mixture comprising:

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- a) a liquid polyisocyanate having an isocyanate content of at least 10% by weight,
- b) an isocyanate reactive component comprising a polyether polyol having from 2 to 6 hydroxyl groups and a number average molecular weight of from 250 to 8,000 and 0 to 10% by weight, based on total weight of b), of a low molecular weight diol or triol having an equivalent weight of from 31 to 99,

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- c) a urethane catalyst and optionally,

- d) a filler,

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- (2) contacting the rigid geotextile and the soft, pliable geotextile in a manner such that the polyurethane composition will be capable of bonding those geotextiles, and
- (3) allowing the polyurethane composition to cure.

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13. The process of Claim 12, wherein the polyether polyol b) comprises a polyoxypropylene polyether having a number average molecular weight of from about 400 to about 4,000 and an average functionality of from 2 to 3.

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14. The process of Claim 12, wherein the polyether polyol b) comprises:

- (i) from about 5 to about 15 parts by weight of a propylene oxide adduct of an alkanolamine which adduct has a number average molecular weight from 250 to about 1000,
- (ii) a propylene oxide adduct of a low molecular weight organic compound having from about 3 to about 6 OH

- groups which adduct has a number average molecular weight of from 250 to 1000, and
- (iii) a propylene oxide adduct of a low molecular weight diol, which adduct has a number average molecular weight of from 250 to about 3000.
- 5 15. The process of Claim 12, wherein the catalyst c) is an organic tin compound.
16. The process of Claim 12, wherein the liquid polyisocyanate
- a) is an aromatic polyisocyanate.
- 10 17. The process of Claim 12, wherein the liquid polyisocyanate
- a) is a polymethylene poly (phenylisocyanate) having an NCO-content of from about 30 to 33% and a viscosity of from about 20 to 2,000 mPa·s at 25°C.
- 15 18. The process of Claim 12, wherein the rigid, dimensionally stable geotextile has a maximum thickness of 1 mm.
19. The process of Claim 12, wherein the soft, pliable geotextile has a minimum thickness of 1 mm.
- 20 21. The process of Claim 12, wherein the soft, pliable geotextile has at least one side burnished.
22. The process of Claim 12, wherein the component b) does not include a low molecular weight diol or triol.
23. The process of Claim 12, wherein two or more polyurethane composite liners are placed over each other.
- 25 24. The process of Claim 12, wherein the polyurethane composition is applied onto of the rigid geotextile in step a).
25. A process for forming a two-ply polyurethane geotextile composite comprising

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- (1) applying a polyurethane composition onto a concrete surface of a ditch or canal by spraying,
- (2) bringing a rigid, dimensionally stable geotextile into contact with surface to which the polyurethane has been applied,
- (3) placing a soft, pliable geotextile on top of the rigid geotextile,
- (4) ensuring that the polyurethane will come into contact with the soft, pliable geotextile to an extent such that the polyurethane can bond the rigid and soft geotextiles, and
- (5) allowing the polyurethane to cure to form a polyurethane geotextile composite, the polyurethane composition comprising a reaction product of a mixture comprising:
- a) a liquid polyisocyanate having an isocyanate content of at least 10% by weight,
 - b) an isocyanate reactive component comprising a polyether polyol having from 2 to 6 hydroxyl groups and a number average molecular weight of from at least 250 to 8,000 and 0 to 10% by weight, based on total weight of b), of a low molecular weight diol or triol having an equivalent weight of from 31 to 99,
 - c) a urethane catalyst, and optionally,
 - d) a filler.

26. A canal or ditch lined with a two-ply polyurethane geotextile composite produced by

- (1) dispensing a polyurethane composition between at least one rigid, dimensionally stable geotextile and at least one soft, pliable geotextile,
- (2) laying the product of (1) onto a surface of a canal or ditch before the polyurethane composition has fully cured,
- (3) conforming the polyurethane/geotextile product laid in (2) to the shape of the surface of the canal or ditch, and
- (4) allowing the polyurethane between the geotextile layers to fully cure to form a polyurethane geotextile composite liner in which the polyurethane composition dispensed in (1) is a reaction product of a mixture comprising:
- a) a liquid polyisocyanate having an isocyanate content of at least 10% by weight,
- b) an isocyanate reactive component comprising a polyether polyol having from 2 to 6 hydroxyl groups and a number average molecular weight of from at least 250 to 8,000 and 0 to 10% by weight, based on total weight of b), of a low molecular weight diol or triol having an equivalent weight of 31 to 99,
- c) a urethane catalyst, and
- optionally,
- d) a filler.

27. The canal or ditch according to Claim 26, wherein the two-ply polyurethane composite is layed on the surface of a canal or ditch in a manner such that the rigid, dimensionally stable geotextile is in direct

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contact with the surface of the canal or ditch before the polyurethane has completely cured.

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